

WHAT IS CLAIMED:

1. A sheet transfer apparatus comprising:
  - a first roller configured to be rotatably driven at a first surface speed;
  - a second roller spaced from the first roller such that the first roller and the second roller are configured to simultaneously engage a media sheet, wherein the second roller is configured to be driven at a second surface speed greater than the first surface speed; and
  - a power train delivering power to the first roller to rotatably drive the first roller, the power train including:
    - a first gear coupled to the first roller;
    - a second gear; and
    - a third gear movable between a first position in which the third gear is in power-transmitting engagement with the first gear and the second gear and a second position in which the third gear is out of engagement with the second gear.
2. The apparatus of claim 1, wherein the first gear and the first roller are configured such that a dwell between the first gear and the first roller is created upon the first roller and the second roller simultaneously engaging the media sheet.
3. The apparatus of claim 2, wherein the third gear is in the first position as the dwell is being created.
4. The apparatus of claim 3, wherein the first gear moves the third gear to the second position upon a maximum dwell being attained.
5. The apparatus of claim 1, wherein the third gear remains in the first position upon the first roller and the second roller simultaneously engaging the media sheet.

6. The apparatus of claim 5, wherein the first roller is configured to rotate relative to the first gear upon the first roller and the second roller simultaneously engaging the media sheet.

7. The apparatus of claim 6, wherein the first roller includes a first dwell mechanism surface and a second dwell mechanism surface, wherein the first gear includes a third dwell mechanism surface and a fourth dwell mechanism surface, wherein the third dwell mechanism surface engages the first dwell mechanism surface to drive the first roller and wherein the second dwell mechanism surface engages the fourth dwell mechanism surface to drive the first gear to move the third gear from the first position to the second position.

8. The apparatus of claim 7, wherein the first dwell mechanism surface is configured to disengage the third dwell mechanism surface upon the first roller and the second roller simultaneously engaging the media sheet.

9. The apparatus of claim 1 including a drag spring coupled between the first roller and the first gear.

10. The apparatus of claim 1, wherein the first roller is a pre-feed roller and wherein the second roller is a separation roller.

11. The apparatus of claim 1, wherein the third gear includes elastomeric teeth.

12. The apparatus of claim 1 including a frame rotatably supporting the first roller and the second roller.

13. The apparatus of claim 1, wherein the power train extends between the first roller and the second roller.

14. The apparatus of claim 12, wherein the power train includes a fourth gear coupled to the second roller and a fifth gear coupled between the fourth gear and the second gear.

15. The apparatus of claim 1 including a frame having a slot, wherein the second gear moves along the slot between the first position and the second position.

16. A sheet transfer apparatus comprising:

a first roller configured to be rotatably driven at a first surface speed;

a second roller spaced from the first roller such that the first roller and the second roller are configured to simultaneously engage a media sheet, the second roller being configured to be driven at a second surface speed greater than the first surface speed;

a power train configured to deliver power to the first roller to rotatably drive the first roller, the power train including:

a first gear;

a second gear; and

a third gear movable between a first position in which the third gear is in power transmitting engagement with the first gear and the second gear and a second position in which the third gear is out of engagement with the second gear; and

a dwell mechanism between the first roller and the first gear, wherein the dwell mechanism is configured to operably couple the first gear to the first roller to drive the first roller when the first roller and the second roller are not simultaneously engaging the media sheet, to enable the first roller to rotate relative to the first gear to create dwell when the first roller and the second roller simultaneously engage the media sheet and to couple the first roller to the first gear such that the first roller drives the first gear to move the third gear to the second position when a maximum dwell has been reached and while the first roller and the second roller simultaneously engage the media sheet.

17. The apparatus of claim 16 wherein the dwell mechanism includes:
  - a first surface and a second surface coupled to the first roller; and
  - a third surface and a fourth surface coupled to the first gear, wherein the third dwell mechanism surface engages the first dwell mechanism surface when the third gear is in the first position and when the first roller and the second roller are not simultaneously engaging the media sheet, wherein the first dwell mechanism surface disengages the third dwell mechanism surface when the first roller and the second roller simultaneously engage the media sheet to create a dwell and wherein the second dwell mechanism surface engages the fourth dwell mechanism surface to drive the first gear and to move the third gear to the second position when a maximum dwell is reached and while the first roller and the second roller simultaneously engage the media sheet.
18. The apparatus of claim 16 including a drag spring coupled between the first roller and the first gear.
19. The apparatus of claim 16, wherein the first roller is a pre-feed roller and wherein the second roller is a separation roller.
20. The apparatus of claim 16, wherein the third gear includes elastomeric teeth.
21. The apparatus of claim 16 including a frame rotatably supporting the first roller and the second roller.
22. The apparatus of claim 16, wherein the power train extends between the first roller and the second roller.
23. The apparatus of claim 21, wherein the power train includes a fourth gear coupled to the second roller and a fifth gear coupled between the fourth gear and the second gear.

24. The apparatus of claim 16 including a frame having a slot, wherein the second gear moves along the slot between the first position and the second position.

25. A sheet transfer apparatus comprising:

a first roller configured to be rotatably driven at a first surface speed;  
a second roller spaced from the first roller such that the first roller and the second roller are configured to simultaneously engage a media sheet, the second roller being configured to be driven at a second surface speed greater than the first surface speed; and

means for cessating transmission of power to the first roller upon the first roller rotating at least 360 degrees after the first roller and the second roller have initially and simultaneously engaged a media sheet.

26. A method for transferring a media sheet, the method comprising:

transmitting torque via a power train while a clutch of the power train is engaged to rotatably drive a first roller while in engagement with the media sheet to transfer the media sheet to a second roller;

rotatably driving the second roller while in engagement with the media sheet;

creating a dwell between the first roller and the power train as the media sheet is simultaneously engaged by the first roller and the second roller;

disengaging the clutch to pause the transmission of torque via the power train to the first roller upon a maximum dwell being attained and while the first roller and the second roller simultaneously engage the media sheet;

engaging the clutch once the media sheet is no longer being simultaneously engaged by the first roller and the second roller; and

consuming the dwell once the media sheet is no longer being simultaneously engaged by the first roller and the second roller.

27. The method of claim 24, wherein the power train includes a first gear coupled to the first roller and a second gear, wherein the clutch comprises a third gear movable between a first position in which the third gear transmits torque from the

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second gear to the first gear and a second position in which the transmission of the torque between the second gear and the third gear is cessated and wherein the step of disengaging the clutch includes moving the third gear to the second position.

28. The method of claim 24, wherein the power train includes a first gear coupled to the first roller and wherein the step of creating a dwell includes rotating the first roller relative to the first gear.

29. The method of claim 26 wherein the first roller is rotatably driven at a first surface speed and wherein the second roller is rotatably driven at a second greater surface speed.